

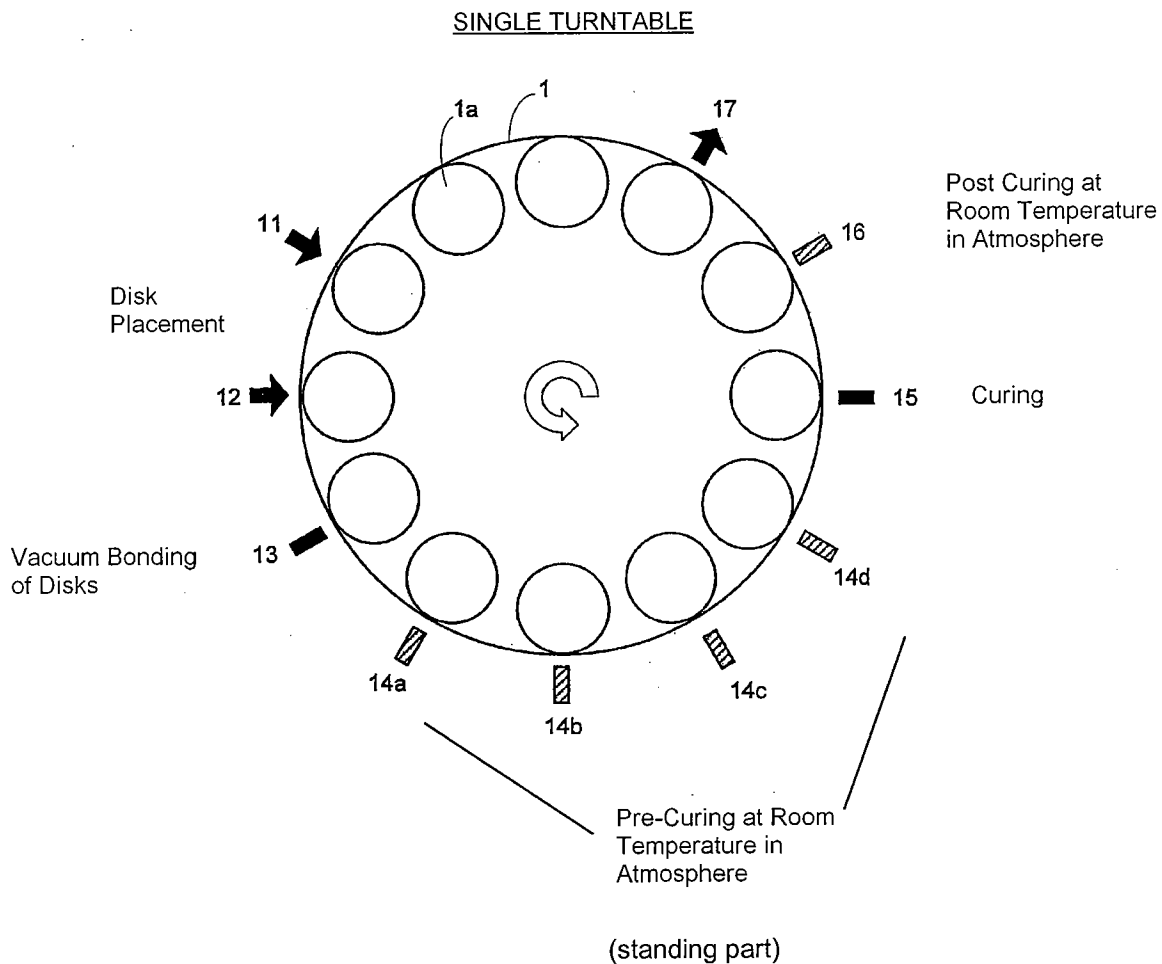
### REMARKS

The present invention is directed to providing a very compact manufacturing foundry for the creation of optical disk media while at the same time preventing a common problem of warping and its result on production yield by a relatively simple and compact apparatus.

As noted in our specification on Page 13, Lines 2-11:

When the substrates thus move through the bonding position 13, pre-curing standing positions 14a through 14d, curing position 15, post-curing standing position 16 and conveying position 17, since the substrates or susceptors carrying substrates are carried on the turntable 1, no work such as shifting by other devices or the like is performed. In other words, at least from the bonding part to the standing parts and curing part, the substrates or susceptors carrying substrates are conveyed without any contact with devices other than the conveying means. (underline added)

As noted in our various embodiments and as illustrated in the embodiment of Figure 1, we provide a structure of a relatively simple configuration. It does not move nor disturb, in any significant manner, a processed pair of plastic substrates to form for example, an optical disk, while relieving internal stresses, which can cause warping.



As can be determined, a single turntable can be used in the first embodiment while smaller turntables within the configuration of the single turntable and disk placements can be entered into the conveying function of the single turntable so that the disks can have adhesive applied and be mounted with vacuum bonding with a subsequent standing part time period of pre-curing at room temperature in an ambient atmosphere, as shown in the above figure.

Subsequently, in the standing part, a curing for example with UV radiation as one possible approach can be accomplished on the same turntable and without any alteration in position of the disks or contact of the disks during processing for a predetermined time period. A

subsequent post-curing at room temperature at a second predetermined time period can be accomplished before egress of the finished disk from the turntable.

The Office Action raised a minor issue with regard to Claims 15 and 17 and applicant wishes to thank the Examiner for bringing the misspellings to their attention, which have now been corrected.

The Office Action rejected Claims 1-4 and 7-9 as being completely anticipated by *Matsumoto et al.* (U.S. Patent Publication 2003/0104097).

*Matsumoto et al.* sought to reduce the possibility of dust or dirt being inserted into a manufacturing processing by using a multiple mounting operation of transferring disks and apparently isolating the various operations through the use of a combination of a plurality of turntables.

Thus, referring to Figure 1, the substrates are molded (1) and delivered to a cooling mechanism (3). The substrates are then aligned to stand in a vertical configuration. A first rotary turntable (5) moves the disks to a second turntable (7), while positioning the disks in a horizontal position. The respective disks are then removed from turntable (7) and provided to a sputtering device (8) to produce a desired reflective films for the optical disks.

A mounting means (9) can discard any rejected disk to a scrap chute (18) while moving the desired disk to a third turntable (10) so that a sprayed adhesive can be applied for a rotation of 360°. A pair of spinners (15, 16) transfer the respective disk to the holding arms on a mounting mechanism (19) which then positions the disk onto a fourth turntable (20). This turntable acts for a pre-curing to prevent any warping by placing a weight on the disk substrate and apparently cooling the weights to remove heat as noted in Paragraphs 0056-0058.

[0056] A weight (not shown) such as an aluminum plate or heat-resistant glass (on a center of which a penetrated hole is provided) is mounted on the disc substrates mounted on turn table 20 at the subsequent position. This weight serves to assist an adjustment of a warp quantity of the disc substrates and three weights are prepared.

[0057] Weight carrying mechanism 22 holds the weight mounted on a center mount position P6 of turn table 20 and carries it to a mounting position P7 and the weight is, then, mounted on the disc substrates.

[0058] On the other hand, at a removing position P8, weight carrying mechanism 22 removes the weight from each of the heat-treated disc substrates and the disc substrate is carried to the mounting position P6 and, at the mounting position P6, the carried weight is mounted on position P6. Hence, it is sufficient to have these weights. The weight is cooled at mounting position P6.

The weights are then removed and ultraviolet rays are used in a curing device (23) to cure the adhesive on the disk substrates. An attempt is made to prevent additional warping by adjusting the amount of radiation quantity applied from either an upper and/or the lower portion of the turntable (20).

A fifth turntable (21) is then utilized for cooling while a de-electrified blower is used in an attempt to remove any dust adhering to the surface of the optical disk. The disks are then removed from the fifth turntable and inspected.

Applicant has further amended the claims and it is respectfully submitted that the 35 U.S.C. §102 rejection over the *Matsumoto et al.* reference is now mooted.

“[T]he dispositive question regarding anticipation is whether one skilled in the art would reasonably understand or infer from the prior art reference’s teaching that every claim [limitation] was disclosed in that single reference.’ *Dayco Prods., Inc. v. Total Containment, Inc.*, F.3d 1358, 1368 (Fed. Cir. 2003).

Referring to Claim 1, we define a conveying means for conveying a substrate from a vacuum vessel into an atmosphere at room temperature that is designed to specifically provide a

standing part which allows the bonded substrates to stand at room temperature in that atmosphere for a time required for any correction of working of the bonded substrate before the adhesive agent is cured.

In summary, the *Matsumoto et al.* reference teaches a series of five turntables with a specific use of weight members to prevent any warping. *Matsumoto et al.* discloses an apparatus for making optical recording disks by adhering together pairs of molded disk substrates on which reflective films have been formed, carrying the bonded substrate pairs to a curing part and irradiating the substrate pairs with ultraviolet rays to cure the adhesive. However, *Matsumoto et al.* does not disclose a conveying means which conveys the substrates from the vacuum vessel into the atmosphere at room temperature after the substrates are bonded in the vacuum vessel of the bonding part being vacuumed. *Matsumoto et al.* does not disclose a conveying means having a standing part which allows the bonded substrates to stand at room temperature in the atmosphere out of the vacuum vessel while conveying the plurality of substrates for the time required for correction of any warping before the adhesive agent can be cured in the curing part.

*Matsumoto et al.* would teach to a person of ordinary skill in this field, the use of weights to prevent warping, not the use of a standing part or a portion of a single conveying means that permits the bonded substrate to stay at a room temperature while continuing to convey the plurality of substrates for a time period required for any correction of warping of the bonded substrates before any curing of the adhesive agent.

As set forth in our specification at Page 10, Lines 26-32:

“It is seen from this example that warping in the radial direction is stabilized if a standing time of 5 seconds or longer is ensured, and that warping in the tangential direction is stabilized if a standing time of 7 seconds or longer is ensured. Accordingly, all warping can be stabilized at a standing time of at least about 7 seconds.” (underline added)

*Matsumoto et al.* further does not disclose the features of our dependent Claim 4 where a plurality of turntables include concentric small diameter and large diameter tables. Additionally, as defined in Claim 7, *Matsumoto et al.* does not disclose an accommodating part which stacks and accommodates a plurality of substrates that are conveyed from the bonding part. The overlapping mechanism 13 on the turntable 10 of *Matsumoto et al.* does not stack the substrates already bonded to each other. The mechanism 13 bonds a substrate A and a substrate B, but does not stack the pairs of substrates after bonding.

The dependent Claim 8 defines a conveying means, which does not provide any operation that would shift the substrates in any interval extending from the bonding part to the curing part. As can be appreciated, *Matsumoto et al.* discloses a clear shifting of substrates with handling devices such as the mounting mechanism 14 and 19 shown in Figure 1.

Dependent Claim 9 further defines the standing part as set to be a time period that is at least equal to a time period required in order to correct any warping of the substrates following bonding. There is no equivalent function nor component in the *Matsumoto et al.* reference that performs this function. Rather, *Matsumoto et al.* addresses any pre-curing warping by placing a weight on top of each substrate pair at position P7 following the bonding.

The Office Action further rejected Claim 15 as being obvious over a combination of *Hosogai* (Japanese Laid-Open Patent Application 10-289491, copy attached hereto) in view of *Kotoyori* (Japanese Laid-Open Application 2002/074759) in view of *Higaki et al.* (U.S. Patent Publication 2002/0108715).

The *KSR* Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some “apparent reason to combine the known elements in the fashion claimed.”

In the same way, when the prior art teaches away from the claimed solution as presented here, obviousness cannot be proven merely by showing that a known composition could have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition.

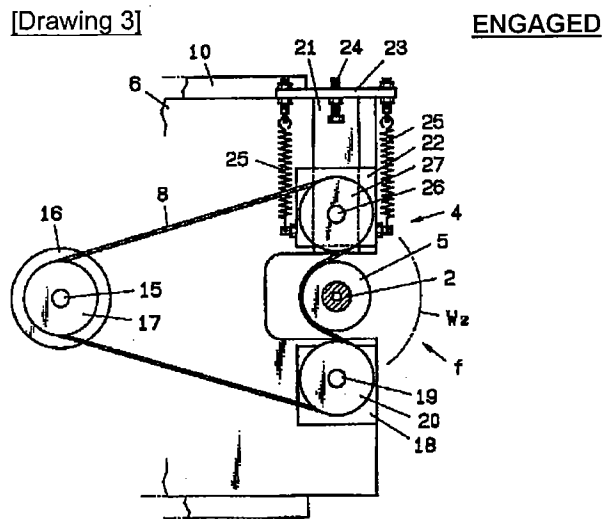
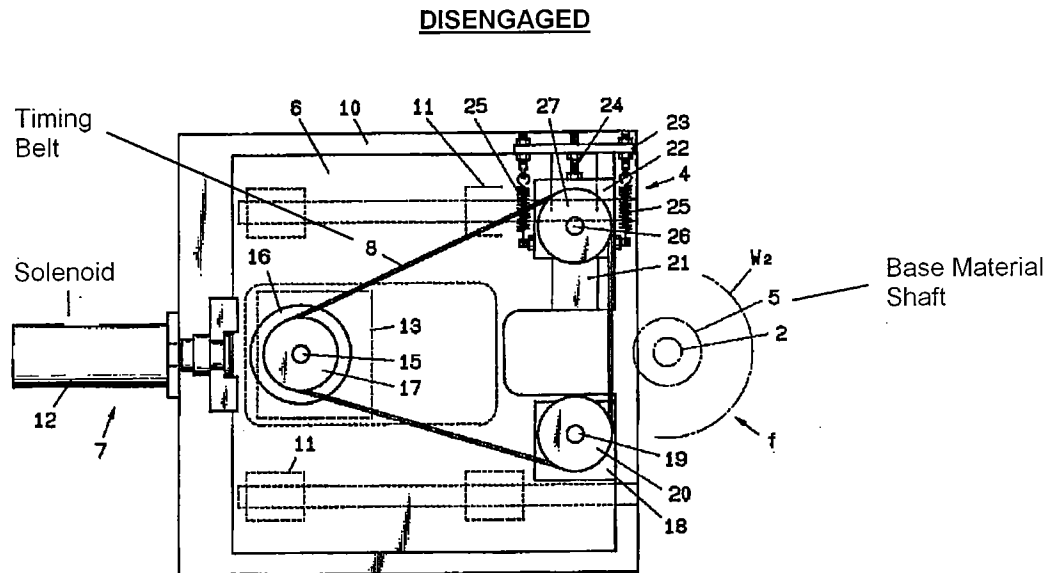
*Ex parte Whalen et al.*, Appeal 2007-4423, slip op. at 16 (B.P.A.I. July 23, 2008) (citing *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007)).

*Hosogai* (Japanese Laid-Open Patent Application 10-289491) discloses a substrate rotary position (f) where the bonded substrates are spun to uniformly distribute an adhesive S. However, *Hosogai* does not disclose a conveying means having a standing part which allows the bonded substrates to stand at room temperature in an atmosphere out of the vacuum vessel while conveying a plurality of substrates for a time period, e.g., 7 seconds required for correction of the warping. “Spinning substrates to uniformly distribute the adhesive” does not mean “standing the substrates for correction of the warping.”

The *Hosogai* reference specifically sought to address a problem associated with decreasing the inertia movement of a turntable that intermittently indexed and rotated at respective working stages, where the products were subject to an adhesive coating, a high speed rotation to remove excessive adhesive material, and subsequent irradiation with UV to cure the adhesive.

The solution to his problem involved a solenoid for driving a shaft (5) by a unique arrangement of a driving belt (8) that can take the form of a timing belt (8). A pair of guide pulleys (20, 27), one of which can be spring biased can be moved together against a substantial surface of the aft or “peripheral face of the solid of revolution 5” to thereby provide a positive

driving and stopping of the work piece and improve the indexing and positioning accuracy of the base material, as can be seen from the following Drawings 3 and 4:



[Drawing 4]

The Office Action acknowledged that the *Hosogai* reference did not teach a standing part of our Claim 1 which allowed bonded substrates to stand at a room temperature in the atmosphere after the initial bonding.



The Office Action asserted, however, that *Kotoyori* addressed the problem of stress and warpage before a curing state, citing the Abstract and Paragraphs 0005 and 0008. The Abstract notes a two part UV irradiation process, the source of UV being moved with an initial small dose of the UV applied for only a partial curing, while a second higher application of UV radiation is applied while the center hole stays free from mechanical stress. The actual teaching is defined as follows, in Paragraph 0009:

[0009] Therefore, this invention piles up the single plate disk of two sheets via UV cure adhesive, where alignment is mechanically carried out for those center holes, the 1<sup>st</sup> UV irradiation is performed, UV cure adhesive is made to thicken, the above-mentioned center hole makes it hard to shift, the 2<sup>nd</sup> UV irradiation is performed in the state where mechanical stress is not given to the center hole after an appropriate time to such an extend that curvature does not occur on the single plate disk of the two above-mentioned sheets, and SUBJECT that the small lamination disk of curvature is obtained is attained. When performing the 2<sup>nd</sup> UV irradiation, SUBJECT that the lamination disk in which curvature is still smaller is obtained is attained by carrying out adhesion maintenance of the single plate disk of two sheets piled up on the flat face of a support member via UV cure adhesive, and carrying out in the small state of curvature.

*Kotoyori* (JP 2002-074739) does not disclose a conveying means which conveys the substrates from a vacuum vessel into an atmosphere at a room temperature after the substrates are bonded in a vacuum vessel while being vacuumed. *Kotoyori* also does not disclose a conveying means having a standing part which allows the bonded substrates to stand at room temperature in the atmosphere out of the vacuum vessel while conveying the plurality of substrates for the time period required for correction of the warping before the adhesive agent being cured in the curing part.

The Office Action relies upon a configuration of not supporting the center part of the work piece as it is transmitted from the alignment stage, element 6 of Drawing 1, to the UV

radiation position P2 shown on the turntable 11 in Drawing 2. As can be appreciated, there is a teaching of an immediate transfer from the bonding stage to the curing stage with either UV or a pulse radiation type of cure. See Paragraph 0039. The teaching to a person of ordinary skill in this field would be to utilize a differential UV radiation step. The two part UV radiation curing would prevent the formation of a major warp that could occur in the normal UV curing.

This basically teaches a change in the curing step by a two part radiation process of a slight radiation initially and then a subsequently heavier radiation to thereby prevent warping. This reference does not suggest nor teach an intentional provision of a standing part before a conventional curing step as defined and claimed in our present claims.

The *Kotoyori* structure is not compatible with a single turntable arrangement, and it discloses a processing apparatus similar to the *Matsumoto et al.* reference.

As noted above, in applying 35 U.S.C. §103, it is necessary to have a clear teaching apart from the present application, to combine diverse references. This is particularly true when citing references that must be clearly understood.

“In relying upon a foreign patent to reject a claim, the Patent Office must construe the disclosure of the foreign reference strictly, and restrict the reference to what is clearly and definitely disclosed.”

*CITC Industries, Inc. v. Manow International Corp.*, 193 U.S.P.Q. 3656, 368 (S.D.N.Y. 1996) .

*Higaki et al.* (U.S. Patent Publication 2002/0108715) discloses that heat warping of the bonded substrates after irradiation can be absorbed by simply allowing time for the substrates to cool and return to their original flat state. However, *Higaki et al.* does not disclose a conveying means having a standing part which allows the bonded substrates to stand at room temperature in

an atmosphere out of the vacuum vessel while conveying the plurality of substrates for a time required for correction of the warping before the adhesive agent is cured in the curing part.

The Office Action also cited *Higaki et al.* which is also designed to translate stacked disks through multiple different stages as opposed to using a compact turntable arrangement. *Higaki et al.* was basically cited to teach a post-curing step after the application of UV light. It does not suggest or teach the standing part of our present claims.

Claims 16 and 17 were rejected over a combination of the *Hosogai*, *Kotoyori* and *Higaki et al.* references, when further taken in view of *Paulus et al.* (U.S. Patent No. 6,098,272) under 35 U.S.C. §103.

It is clear that the four diverse references are lacking a common teaching reference for combining them in the manner suggested in the rejection.

*Paulus et al.* discloses a conveying unit (25) for conveying the bonded disks from the bonding station (35) to a spin station (40) and spinning the disks to distribute the adhesive evenly. However, *Paulus et al.* does not disclose a conveying means having a standing part which allows the bonded substrates to stand at room temperature in the atmosphere out of the vacuum vessel while conveying the plurality of substrates for the time required for correction of the warping. “Spinning the combinations to distribute the adhesive evenly” does not mean “standing the substrates for correction of the warping.”

The *Paulus et al.* was also cited for purportedly teaching a standing time of 15 seconds to permit the adhesive to spread sufficiently between the substrates. As can be appreciated, the adhesive is generally spread by a spinning rotation. Actually, the cited portions of the *Paulus et al.* disclosure in the Office Action define the spin station in Column 4, Lines 33-35 and define the conveyor shown in Figure 2, to move the disk from an in-feed station 20 through the

metallization station 30 with a time delay of 32 seconds so that cooling fans can cool the substrates from 250°F to approximately 80°F. There is no teaching of the standing part shown in our Figure 1 between the bonding station and before the UV curing station.

In summary, applicant has provided a significant improvement in a compact bonding apparatus that has not been recognized nor taught by any combination of the references of record.

“Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light.”

*Continental Can Co. USA Inc. v. Monsanto Co.*, 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

None of the references alone or in combination recognized this issue nor do they offer any solution to a problem uniquely recognized and solved by our present applicant. To assert that a person of ordinary skill in the field could then optimize such features when a person of ordinary skill in the field was not even informed of the problem or issue resolved, is not proper under MPEP §2144.05(II)(B).

The U.S. Patent Office must use common sense in interpreting references and is very cognizant of the problem of hindsight so that words in claims are not taken out of context and irrationally combined in a 35 U.S.C. §103 rejection.

The new Claims 18-23 incorporate the above distinguishing features.

Applicant believes the application is now in condition for allowance.

If the Examiner believes a telephone interview will assist in the prosecution of this case,  
the undersigned attorney would appreciate a telephone conference.

Very truly yours,

**SNELL & WILMER L.L.P.**

A handwritten signature in black ink, appearing to read 'J. Price', is written over a horizontal line.

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